

Two new species and taxonomic notes on species of *Moeris* Godman, 1900 (Hesperiidae, Hesperinae, Moncini)

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Abstract. *Moeris* Godman, 1900 was described to include two species, being afterwards combined with 10 additional species by Evans (1955). As the male genitalia of several Moncini species have been illustrated and described during recent decades, taxonomic rearrangements reduced the number of species in *Moeris* to four. In the present study two new species are described: *Moeris seth* Mielke, Carneiro & Casagrande **sp. nov.** from southern and southeastern Brazil, and *Moeris nut* Mielke, Carneiro & Casagrande **sp. nov.** from the Ecuadorian and Peruvian Andes. The status of *Moeris menopis* (Schaus, 1902) **stat. rest.** is revalidated; *Moeris strada* Evans, 1955 **stat. nov.** and *Moeris stroma* Evans, 1955 **stat. nov.** are elevated to species level; and a new combination of *Mnasitheus submetallescens* (Hayward, 1940) **comb. nov.** is proposed given the similar pattern of stigma, male and female genitalia to *Mnasitheus* Godman, 1900 species, rather than with *Moeris striga* (Geyer, 1832), the type species of *Moeris*. Also, a neotype of *Moeris striga* and the lectotype of *Moeris menopis* are here designated in order to ascertain their taxonomic status. The female genitalia of the species studied are illustrated for the first time.

Key words: Neotropical skipper, Hesperioidea, taxonomy, new combination.

INTRODUCTION

Moeris Godman, 1900 was described to include two species with Central American distribution. Evans (1955) added 10 more species to *Moeris*, including further subspecific taxa within *Moeris striga* (Geyer, 1832), *M. vopiscus* (Herrich-Schäffer, 1869) and *M. hyagnis* (Godman, 1900), in all totaling 17 taxa. Evans (1955), besides proposing the synonymy of *Remella* Hemming, 1939, combined these species into *Moeris* based on vague characters that are also widely shared with other Moncini taxa (e.g. length of antennae > ½ of costa; palpi slender, third segment short and conical; mid-tibiae spined).

After observing the contrasting patterns in the male genitalia of different species of *Moeris*, Burns

(1990) revalidated the genus *Remella* Hemming, 1939, including only its type species *Hesperia remus* Fabricius, 1798, yet leaving all other species in *Moeris*. According to Burns, male genitalia of *Remella remus* resemble those within a cluster of genera, the “group of *Amblyscirtes* Scudder, 1872, *Mnasicles* Godman, 1901 and *Callimormus* Scudder, 1872”, instead those of the *Moeris* species. *Remella rita* (Evans, 1955), *R. duena* (Evans, 1955), and *R. vopiscus* (Herrich-Schäffer, 1869) were subsequently cited in this new combination due to their resemblance with *Remella remus* (Freeman 1991; Stanford & Opler 1993; Warren *et al.* 1998). Further species were subsequently removed from *Moeris* by Mielke & Casagrande (2002): *M. crispinus* (Plötz, 1882) was considered as a subspecies of *Monca telata* (Herrich-Schäffer, 1869); *M. rivera* (Plötz, 1882) was recognized as a valid species within *Callimormus*; and *Perimeles stollmeyeri* Bell, 1931 was recognized as junior synonym of *Mnasicles hicetaon* Godman, 1901.

Accordingly, *Moeris* was then composed of five species (Mielke, 2004; 2005) until the recent discovery that the type of *Moeris ekka* Evans, 1955 is related to *Wahydra* Steinhauser, 1991 based on forewing brand and genitalia morphology (Henao *et al.* in press). Therefore, integrating all recent taxonomic actions, *Moeris* is currently recognized to contain four species, though much incongruence still remains to be solved.

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The present work aims to contribute to the taxonomic arrangement, in the light of insights from morphological characters of the male and female genitalia of *Moeris striga* (and its subspecies) and of *M. submetallescens*.

MATERIAL AND METHODS

Specimens used in this study are deposited in the following collections: DZUP (Coleção Entomológica Pe. Jesus Santiago Moure, Departamento de Zoologia, Universidade Federal do Paraná, Curitiba, Paraná, Brazil), DD (private collection Diego Dolibaina, Curitiba, Paraná, Brazil), and OM (private collection Olaf Mielke, Curitiba, Paraná, Brazil). Additionally, types of *Moeris* taxa were studied from the Natural History Museum, London, United Kingdom, and IMLA (Fundación e Instituto Miguel Lillo, Tucuman, Argentina). A species catalogue is available in Mielke (2005).

Genitalia of both sexes were prepared with standard methods and illustrated. Abbreviations used throughout this paper are: DFW - dorsal forewing; DHW - dorsal hindwing; VFW - ventral forewing; VHW - ventral hindwing; m - male; f - female. Size is given as the length of forewing. Species descriptions were made using 3i Interactive Key and Taxonomic Database (Dmitriev & Dietrich, 2008).

RESULTS AND DISCUSSION

Moeris striga (Geyer, 1832)
(Figs. 1, 8, 15, 22, 28)

Diagnosis: Dorsal and ventral wings as in *Moeris seth* Mielke, Carneiro & Casagrande **sp. nov.**, *M. strada* Evans, 1955 **stat. nov.**, and *M. stroma* Evans, 1955 **stat. nov.** Posterior margin of harpe smooth, but with an inner parallel spined protruding line. Ampulla with dorsal elongated spine and spined dorsal margin. Aedeagus with an elongated, serrated cornutus besides an equally long globular cornutus with a spine on tip; lamella antevaginalis placed anterior of lamella postvaginalis as in *M. seth* Mielke, Carneiro & Casagrande **sp. nov.**, but shorter; posterior margin of lamella postvaginalis thin and bilobed.

Remarks: Dorsal wing markings (subapical and cell spots), and ventral wing spots and bands vary in presence, development and shape between specimens, not only in *M. striga*, but also in all other *Moeris* species. Thus, it is difficult to identify these species using only wing characters. On the other hand, the unique male and female genitalia morphology confirms its species status, which was observed after dissecting and analyzing 47 specimens. A neotype designation is necessary in this case, to clarify its taxonomic status, since the diagnostic characters can only be seen in the genitalia. Genitalia, however, were not mentioned in its original description. The type specimen(s) of *Talides striga* Geyer, 1832 is lost, as many types of Geyer's collection (Friedlander, 1987; Pelham, 2008). Although two type specimens of Carl Geyer are reportedly deposited in the Museum für Naturkunde (Berlin, Germany), these specimens (as many other Hesperidae types) have never been seen by any researcher in Berlin nor in any other museum. As wing markings and original descriptions are

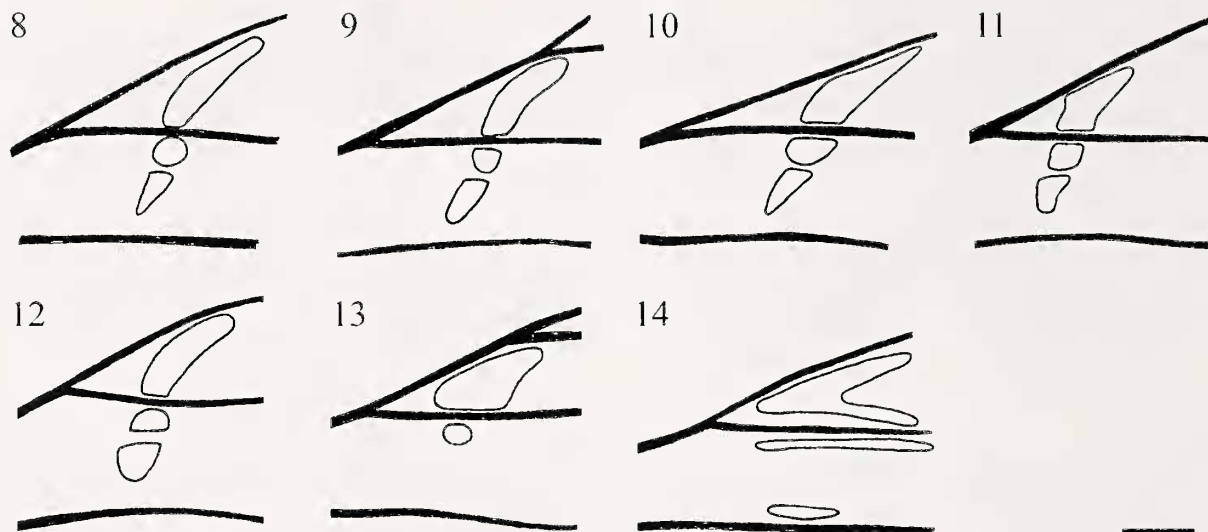
not sufficient to provide a reliable species recognition, an actual specimen is necessary to represent the name and provide stability of nomenclature. As the type locality in the original description is stated only as "Rio", we dissected and analyzed 19 specimens from different locations in Rio de Janeiro city, plus 5 other specimens from other cities in Rio de Janeiro state. All of them presented the same characters as described above. Therefore, the neotype of *Moeris striga* is hereby designated with the following labels: / Neotypus / *Talides striga* Geyer, 1832, D'Alm. det. / Male capt. 10-II-1927, Covanca - Jacarépaguá - Rio [de Janeiro,] Ferreira d'Almeida [leg.] - Rio / Coll. D'Almeida / Topótipo / N° 11980 / DZ 31.525 / Neotypus *Talides striga* Geyer, 1832, Carneiro, Mielke & Casagrande det. 2014 / DZUP.

Geographical distribution: lowland Brazilian Atlantic forest, including western semi-deciduous ecosystems and gallery forest among the cerrado.

Studied material: **Argentina:** 1m, Misiones, Dos de Mayo 26.II.1989, Foerster leg., OM 22.016 (OM). **Bolivia:** 2m, 1f, La Paz, Caranavi V-VI.1989, VIII.1989, Tello leg., OM 24.216, OM 24.512, OM 23.951 (OM). **Brazil:** 1m, Bahia, Rio de Contas, Jitaúna, DZ 31.588, 26.III.1969, Ebert leg., (DZUP). 1f, Ceará, Viçosa do Ceará, 3 km W, 28.V.2013, Dolibaina & Pessoa leg., DD 001 (DD). 1m, Ceará, Guaramiranga, 13-15.VII.2012, Dolibaina & Lima leg., DD 002 (DD). 1m, 1f, Distrito Federal, Brasília Escola Fazendária, 3.VI.1977, 6.VI.1977, Gifford leg., DZ 31.354, DZ 31.423 (DZUP). 1f, Distrito Federal, Brasília Fazenda Água Limpa, 25.V.1976, Gifford leg., DZ 31.427 (DZUP). 1m, 1f, Espírito Santo, Baixo Guandu, 16.IX.1966, 5.IX.1971, Elias & Elias leg., DZ 31.370, DZ 31.508, DZ 31.570 (DZUP). 2m, Espírito Santo, Conceição da Barra 10.IV.1968, 5.V.1968, Elias & Elias leg., DZ 31.608, DZ 31.371 (DZUP). 1m, 1f, Espírito Santo, Linhares 25-30.VI.1975, V.1982, Elias leg., DZ 31.398, DZ 31.610 (DZUP). 1m, Espírito Santo, Linhares, Reserva Sooretama, Mielke & Brown leg., DZ 31.585 (DZUP). 1m, Espírito Santo, Santa Leopoldina 26.VII.1966, Mielke, Brown & Elias leg., DZ 31.287 (DZUP). 1m, Espírito Santo, Santa Leopoldina, Tirol, 25-28. IV.2001, Moser leg., DZ 27.388 (DZUP). 1m, Espírito Santo, Santa Teresa 26.II.1972, Ebert leg., DZ 27.553 (DZUP). 7f, 6m, Espírito Santo, Santa Teresa, 21-27.IX.1966, 4.XII.1966, 6.I.1967, 18.I.1967, 18-24.I.1967, 25.I.1967, 12.V.1967, 5.IX.1967, 13.IX.1967, 3.XI.1967, 22.XI.1967, 20.VII.1969, Elias & Elias leg., DZ 31.788, DZ 31.278, DZ 31.758, DZ 31.620, DZ 31.580, DZ 31.530, DZ 31.471, DZ 31.447, DZ 31.438, DZ 31.418, DZ 31.365, DZ 31.360, DZ 27.339 (DZUP). 1m, Espírito Santo, São Mateus, X.1985, Elias leg., DZ 31.454 (DZUP). 1m, 1f, Maranhão, Imperatriz 18.VI.1974, 3.VII.1974, Mielke leg., DZ 31.281, DZ 31.674 (DZUP). 1m, Maranhão, Açailândia, 23.VIII.1974, Mielke leg., DZ 27.550 (DZUP). 1m, Maranhão, Santa Lucía, Fazenda Terrasse, 2.VIII.1974, Mielke leg., DZ 27.360 (DZUP). 4m, Minas Gerais, Caratinga, 29.I-3.II.2003, Mielke & Casagrande leg., DZ 31.718, DZ 31.715, DZ 31.328, DZ 27.341 (DZUP). 4m, 3f, Minas Gerais, Corinto 2-14.IV.1979, 1-15.VI.1979, 16-30.VI.1979, VII.1979, 16-31.VIII.1979, Elias leg., DZ 31.235, DZ 31.407, DZ 31.458, DZ 31.527, DZ 31.305, DZ 31.558, DZ 31.578 (DZUP). 2m, Minas Gerais, Paracatú, 16.VI.1972, Mielke & Brown leg., DZ 31.397, DZ 31.340 (DZUP). 1m, Minas Gerais, Poços de Caldas, 22.V.1969, Ebert leg., DZ 31.335 (DZUP). 1m, Paraná, Antonina, Cacatú, 25.IV.1973, Mielke leg., DZ 31.555 (DZUP). 2m, Paraná, Fênix, 29.IV.1987, Mielke & Casagrande leg., DZ 31.761, DZ 31.661 (DZUP). 2m, 2f, Paraná, Guaíra, 8.X.1982, Mielke leg., DZ 31.388, DZ 31.518, DZ 31.348, DZ 31.338 (DZUP). 1m, Paraná, Guaraqueçaba, Tagaçaba, 17.IV.1971, Mielke leg. DZ 31.378 (DZUP). 1m, Paraná, Guaratuba, Limeira, 21.IV.2000, Mielke leg., OM 51.708 (OM). 1m, Paraná, Londrina, 10.IX.1985, Mielke & Casagrande leg., DZ 31.637 (DZUP). 1f, Paraná, Matinhos, I-XI.1967, Moure & Willink leg., DZ 31.268 (DZUP). 1m, Paraná, Terra Rica, Parque Municipal Três Morrinhos, 13.X.2011, Carneiro, Dolibaina & Salik leg., DZ 31.330 (DZUP). 1m, Pernambuco, Garanhuns 14.XI.1960, Ebert leg., DZ 31.768 (DZUP). 1m, Rio de Janeiro, Duque de Caxias,



Figures 1-7. Dorsal and ventral views of *Moeris* Godman, 1900 and *Mnasihtus* Godman, 1900, species analyzed in the present study: a. dorsal view of males; b. ventral view of males; c. dorsal view of females; d. ventral view of females. 1. *Moeris striga* (Geyer, 1832) OM 20.640, OM 17.325; 2. *Moeris seth* Carneiro, Mielke & Casagrande **sp. nov.** DZ 31.367 (HOLOTYPE), DZ 31.410 (ALLOTYPE); 3. *Moeris menopis* (Schaus, 1902) **stat. rest.** DZ 27.488, OM 25.611; 4. *Moeris strada* Evans, 1955 **stat. nov.** OM 41.721, OM 25.653; 5. *Moeris stroma* Evans, 1955 **stat. nov.** OM 24.820, DZ 31.214; 6. *Moeris nut* Mielke, Carneiro & Casagrande **sp. nov.** OM 25.659 (HOLOTYPE); 7. *Mnasihtus submetallescens* Evans, 1955 **comb. nov.** DZ 31.644, OM 29.912. Scale bar: 1 cm.



Figures 8-14. Brand format on dorsal forewing of species observed in the present study: 8. *Moeris striga* (Geyer, 1832); 9. *Moeris seth* Carneiro, Mielke & Casagrande **sp. nov.**; 10. *Moeris menopis* (Schaus, 1902) **stat. rest.**; 11. *Moeris strada* Evans, 1955 **stat. nov.**; 12. *Moeris stroma* Evans, 1955 **stat. nov.**; 13. *Moeris nut* Mielke, Carneiro & Casagrande **sp. nov.**; 14. *Mnasitheus submetallescens* Evans, 1955 **comb. nov.** Scale bar: 1 mm.

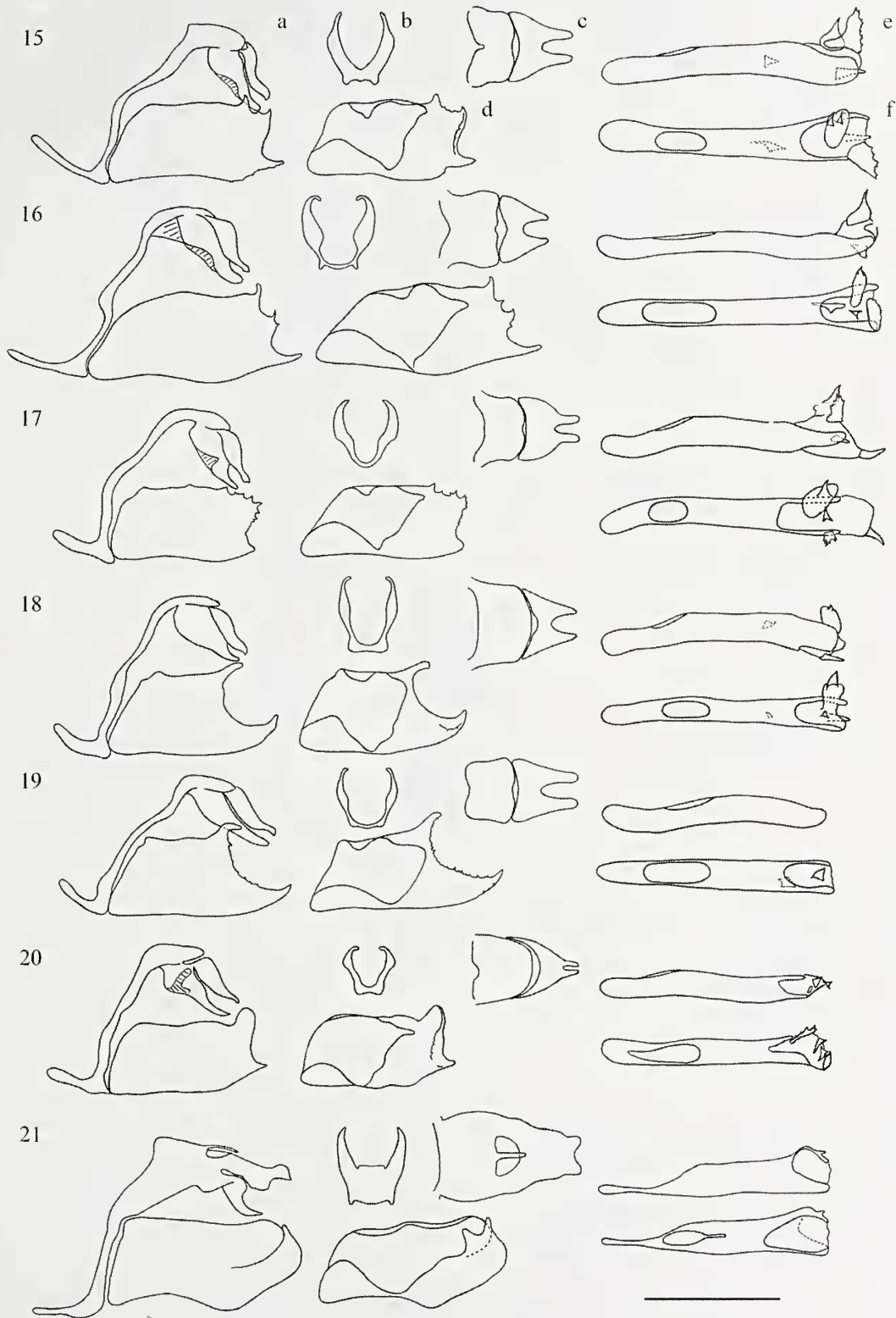
Imbariê, 21.IV.1956, Ebert leg., DZ 31.315 (DZUP). 1m, Rio de Janeiro, Itatiaia, Parque Nacional do Itatiaia, 12.VII.1963, Mielke leg., OM 5.194 (OM). 1m, Rio de Janeiro, Nova Friburgo, Murry, Pico São João, 22-23.I.1996, Mielke & Mielke leg., OM 41.694 (OM). 2f, Rio de Janeiro, Petrópolis, Alto da Serra, 10.V.1964, 27.IX.1964 (Mielke leg.), OM 5.877, OM 6.084 (OM). 1m, Rio de Janeiro, Rio de Janeiro, Covanca, 22.V.1945, D'Almeida leg., DZ 31.735 (DZUP). 3m, Rio de Janeiro, Rio de Janeiro, Covanca, 25.IV.1962, 20.IV.1963, 28.II.1965, Mielke leg., OM 4.405, OM 4.967, OM 6.929 (OM). 3m, Rio de Janeiro, Rio de Janeiro, Jacarépaguá, 10.II.1927, 10.IV.1941, 14.VI.1945, D'Almeida leg., DZ 31.525, DZ 31.500, DZ 31.485 (DZUP). 1f, Rio de Janeiro, Rio de Janeiro, Lagoinhas, 9.III.1952, Ebert leg., DZ 31.645 (DZUP). 1f, Rio de Janeiro, Rio de Janeiro, Muriqui, 2.IV.1951, (Ebert leg.), DZ 31.551 (DZUP). 2m, Rio de Janeiro, Rio de Janeiro, Pão de Açúcar, 9.IX.1951, 19.I.1952, Ebert leg., DZ 31.625, DZ 31.695 (DZUP). 1m, Rio de Janeiro, Rio de Janeiro, Sumaré, 9.VII.1968, Brown leg., DZ 31.411 (DZUP). 4m, Rio de Janeiro, Rio de Janeiro, Sumaré, 7.V.1965, 10.IX.1965, Mielke leg., OM 10.602, OM 6.822, OM 7.392, OM 7.393 (OM). 1f, Rio Grande do Sul, Tenente Portela, Parque Estadual do Turvo, 10.XI.1985, Mielke, Araújo & Casagrande leg., DZ 31.221 (DZUP). 1f, Rondônia, Ariquemes, 60 km SE, 17-20.III.1989, Mielke leg., OM 22.333 (OM). 2m, Rondônia, Cacauplândia, 8-19.XI.1994, Mielke leg., OM 36.586, OM 38.369 (OM). 2m, Rondônia, Cacauplândia, Rancho Grande, 17.XI.1991, Mielke leg., OM 28.142, OM 28.118 (OM). 1m, Santa Catarina, Alto Rio dos Cedros, 18.I.1973, Lauterjung leg., DZ 31.300 (DZUP). 1f, Santa Catarina, Balneário Camboriú, 21.I.1984, Mielke leg., DZ 31.368 (DZUP). 1m, Santa Catarina, Florianópolis, Naufragados, 18.X.2003, Mielke & Carneiro leg., DZ 31.617 (DZUP). 1m, Santa Catarina, Joinville, 16-21.I.1981, Ebert leg., DZ 31.635 (DZUP). 15m, 2f, Santa Catarina, Joinville, 28.X.1967, 6.VII.1969, 24.IV.1971, 9.X.1972, 26.XII.1976, 15.I.1977, 10.II.1978, 2.XII.1978, 24.XII.1978, 29.XII.1987, 4.I.1988, 14.V.1988, 8.X.1988, 18.III.1989, Mielke & Miers leg., DZ 31.787, DZ 31.604, DZ 31.478, DZ 31.488, DZ 31.505, DZ 31.364, DZ 31.318, DZ 31.475, DZ 31.428 (DZUP); OM 16.846, OM 16.845, OM 18.261, OM 18.263, OM 18.262, OM 18.838, OM 20.640, OM 20.699, OM 51.491

(OM). 4m, 2f Santa Catarina, Joinville, 25.IX.1966, 17.IX.1967, 4.X.1967, 7.X.1967, 9.IX.1968, Miers leg., DZ 31.258, DZ 31.248, DZ 31.468, DZ 31.515, DZ 31.680, DZ 31.774 (DZUP). 12m, 1f, Santa Catarina, Joinville, 27.X.1968, 27.III.1970, 20.XI.1970, 24.IV.1971, 22.III.1986, 14.IV.1988, Mielke leg., DZ 31.597, DZ 31.568, DZ 31.574, DZ 31.545, DZ 31.337, DZ 31.460, DZ 31.550, DZ 31.517, DZ 31.377, DZ 31.510, DZ 31.387 (DZUP); OM 17.324, OM 17.325, OM 17.326 (OM). 1f, Santa Catarina, São Bento do Sul, 20.I.1971, Ebert leg., DZ 31.408 (DZUP). 2m, 2f, Santa Catarina, São Bento do Sul, Mato Preto, 11.IV.1971, Mielke leg., DZ 31.264, DZ 31.560, DZ 31.520, DZ 31.225 (DZUP). 1m, Santa Catarina, São Bento do Sul, Rio Vermelho, 1.II.1974, Rank leg., DZ 31.507 (DZUP). 1f, Santa Catarina, São Francisco do Sul, Vila da Glória, 21.I.1982, West & Mielke leg., DZ 27.403 (DZUP). 1m, São Paulo, Araras, 15.V.1966, Ebert leg., DZ 31.420 (DZUP). 1m, São Paulo, Rio Claro, 29.VI.1962, Ebert leg., DZ 31.404 (DZUP). 1f, São Paulo, Rio Claro, 27.IV.1971, Mielke leg., DZ 31.660 (DZUP). 1f, São Paulo, São Paulo, Túnel da Mata Fria, 13.II.1976, Mielke & Casagrande leg., DZ 31.381 (DZUP). 1f, São Paulo, Ubatuba, 14.IX.1980, Ebert leg., DZ 31.405 (DZUP). **Paraguay:** 1m, Alto Parana, Itakyry, General Dias, 15-20.I.1980, Mielke, Mielke & Miers leg., DZ 31.559 (DZUP). **Peru:** 1m, Junin, San Ramon, Hacienda Naranjal, 15-18.X.1989, Mielke & Casagrande leg., OM 23.158 (OM).

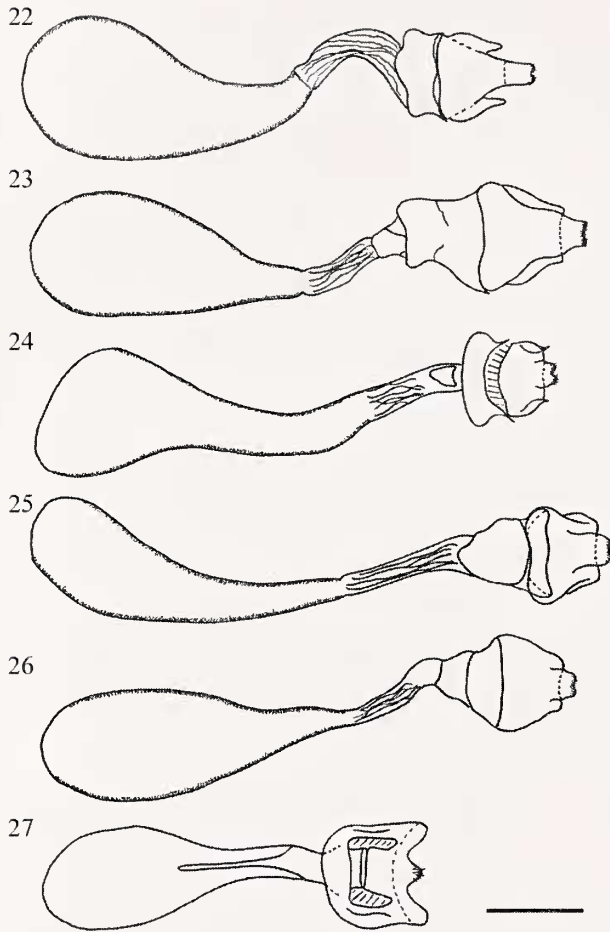
Moeris seth Mielke, Carneiro & Casagrande **sp. nov.** (Figs. 2, 9, 16, 23, 28)

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Diagnosis: Dorsal and ventral wing pattern as in *Moeris striga*, *M. menopis*, *M. strada* and *M. stroma*. However, male and female genitalia present unique characters. Posterior margin of harpe with a spined prominence between its ventro-posterior projection and the dorsal spined projection of ampulla. One of cornuti spines is globular with a spine on tip, as in *M. striga*, but the other serrate



Figures 15-21. Male genitalia of *Moeris* Godman, 1900 species analyzed in the present study: a. lateral view of tegumen, saccus, uncus, gnathus and valva; b. ventral view of fultura inferior; c. dorsal view of tegumen and uncus; d. left view of the right valva; e. lateral view of aedeagus; f. dorsal view of aedeagus. **15.** *Moeris striga* (Geyer, 1832). OM 23.158; **16.** *Moeris seth* Carneiro, Mielke & Casagrande **sp. nov.** DZ 31.294 (PARATYPE); **17.** *Moeris menopis* (Schaus, 1902) **stat. rest.** OM 25.605; **18.** *Moeris strada* Evans, 1955 **stat. nov.** OM 41.721; **19.** *Moeris stroma* Evans, 1955 **stat. nov.** OM 26.666; **20.** *Moeris nut* Mielke, Carneiro & Casagrande **sp. nov.** OM 25.659 (HOLOTYPE); **21.** *Mnasitheus submetallescens* Evans, 1955 **comb. nov.** DZ 9.742. Scale bar: 1 mm.



Figures 22-27. Ventral view of female genitalia of *Moeris* Godman, 1900 species analyzed in the present study: 22. *Moeris striga* (Geyer, 1832) DZ 31.235; 23. *Moeris seth* Mielke, Carneiro & Casagrande **sp. nov.** DZ 31.264 (PARATYPE); 24. *Moeris menopis* (Schaus, 1902) **stat. rest.** OM 25.635; 25. *Moeris strada* Evans, 1955 **stat. nov.** OM 25.653; 26. *Moeris stroma* Evans, 1955 **stat. nov.** OM 44.304; 27. *Mnasitheus submetallescens* Evans, 1955 **comb. nov.** OM 51.287. Scale bar: 1 mm.

spine is of the same size as other spines and not developed as in the species mentioned. Female sterigma elongated as in *M. striga*, but lamella antevaginalis longer and quadrangular; posterior margin of lamella postvaginalis larger and straight, instead of bilobed.

Description: Forewing length: 11–13mm. Eyes red. Vertex dark brown. Antennae longer than 1/2 costa; club short (1/4 shaft); shaft ventrally yellowish to ochreous; nudum 12, extended to the clava. Palpus quadrate (inner edge equal to the transverse width); second segment ventrally yellowish; third segment medium, around half of the second segment length, cylindrical. Thorax dorsally and ventrally dark brown, with distinct ochreous tegula. DFW uniformly brown, except for the reddish scales in the base of costal area and the variably present yellowish subapical and upper cell spots. Brand tripartite, elongated and curved between CuA_1 and CuA_{2+3} , as a rounded spot below CuA_2 , and coma-shaped CuA_2 and 2A. VFW costal area reddish at the base turning slightly yellowish at apex; apical spot markedly yellowish, contiguous with marginal

band, which extends and fade beyond CuA_3 ; subapical spots in R_3 - M_1 also yellowish, opaque, and dorsally contiguous with marginal band by a costal yellowish line. DHW homogeneous brown. VHW ground color in variegated yellowish, reddish, black and purple tones spots. Legs yellowish to ochreous; tibial spurs formula 0-1-2; mid and hindtibia spined. Male genitalia: Median apophyses of tegumen absent; fenestra reduced, triangular, wider than long. Saccus lobbed, not reduced nor elongated. Uncus bifid, arms medially separated, separated from each other by a short distance. Gnathos hooked-shaped, with a ventral membranous patch. Valva without posterior median cleft dividing ampulla from harpe; sacculus triangular, shorter than half of valva height; harpe projected posteriorly, ventrally as a short more or less straight spur, while medially lobed with spines; ampulla with a dorsal projection as a spine. Aedeagus cylindrical, shorter than valva + saccus length; coecum shorter than the distal part of aedeagus, dorsally and laterally straight, globular; posterior end laterally projected by parallel truncated projections, therefore dorsally and ventrally hollowed; vesica membranous with four relatively large spines as cornuti, two triangularly spined, one spatular with serrate posterior margin, and the other larger, globular, with a spine on its tip. Futura inferior directed dorsally and posteriorly; projections thin, extended only laterally of aedeagus; ventrally straight, with antero-ventral lobes. Female abdomen with sensitive spots in pleura above sternum IV, V and VI. 8th tergite with espiracular opening present, ellipsoid, not totally separated from external margin. Female genitalia: Lamella antevaginalis quadrate, projected below anterior part of lamella postvaginalis forming a sclerotized tube hiding the ostium bursae. Lamella postvaginalis elongated, with lateral folding towards the pleura; posterior margin more or less straight, with minute setae clothing. Ductus bursae sinuous, proximally sclerotized, with medio-distal sclerotized grooving and thin lateral signa markings from the end of grooving to the bottom of the corpus bursae.

Geographical distribution: Southern Brazilian Araucaria forest, extending to its northern highland enclaves, from Minas Gerais to Rio Grande do Sul.

Studied material: HOLOTYPE (DZUP): male with the following labels: / Holotypus / Curitiba[,] PR[Paraná], Brasil[,] 900m 20-II-1968[,] [O.] Mielke leg./ DZ 31.367 / ALLOTYPE (DZUP): female with the following labels: Curitiba – Paraná[,] 900 metros – Brasil[,] 5-IV.1974[,] O. Mielke leg./ DZ 31.410/. PARATYPES: Paratypus: **Brazil:** 1m, Minas Gerais, Camanducaia, Monte Verde, 18-21. III.1964, Ebert leg., DZ 31.284 (DZUP). 1m, Minas Gerais, Poços de Caldas, 17.XII.1965, Ebert leg., DZ 31.394 (DZUP). 2m, Minas Gerais, Poços de Caldas, Morro São Domingos, 30.III.1965, Mielke leg., OM 6.820, OM 6.821 (OM). Paraná, Almirante Tamandaré, Tanguá, 28.V.1966, Mielke leg., DZ 27.421 (DZUP). 8m, 2f, Paraná, Curitiba, 31.I.1966, 22-IV-1967, 4.V.1967, 22.III.1969, 20.III.1970, 17.II.1971, 5.IV.1974, 13.II.1975, Mielke leg., DZ 27.491, DZ 31.228, DZ 31.291, DZ 31.294, DZ 31.440, DZ 31.430, DZ 31.495, DZ 31.534, DZ 31.664 (DZUP); OM 7.922 (OM). 1m, Paraná, Curitiba, Moure leg., II.1941, DZ 31.455 (DZUP). 4m, 1f, Paraná, Curitiba, Cascatinha, 29.V.1966, 30.XI.1966, 29.I.1967, 22.IV.1967, Mielke leg., DZ 31.451, DZ 31.308, DZ 31.238, DZ 31.628, DZ 31.298 (DZUP). 2m, Paraná, Guarapuava, 13.I.1980, Mielke & Miers leg., DZ 31.577, DZ 31.261 (DZUP). 1m, Paraná, Guarapuava, Rio Iguaçu, 4.II.1976, Mielke & Buzzi leg., DZ 31.567 (DZUP). 1m, Paraná, Tijucas do Sul, Vossoroca, 8.III.1972, Mielke leg., DZ 31.470 (DZUP). 1m, Paraná, Turvo, Britador, 6.I.2010, Dolibaina leg., DD 003 (DD). 1m, Paraná, Turvo, Britador, 24-30.XII.2010, Dolibaina leg., DD 004 (DD). 2m, Paraná, Turvo, Britador, 22.II.2012, Dolibaina leg., DD 005 (DD). 1m, Paraná, Turvo, Britador, 21.XII.2014, Dolibaina leg., DD 006 (DD). 1m, Paraná, Turvo, Britador, 23.XII.2014, Dolibaina leg., DD 007 (DD). 1f, Paraná, Turvo, Salto do Paulinho Rickli, 27.XII.2014, Dolibaina leg., DD 008 (DD). 1m, Rio Grande do Sul, Caxias do Sul, 28.II.1973, Mielke leg., DZ 31.627 (DZUP). 1m, Rio Grande do Sul, Ivoti, 7.IV.2000, Moser leg., DZ 31.251 (DZUP). 1m, Rio Grande do

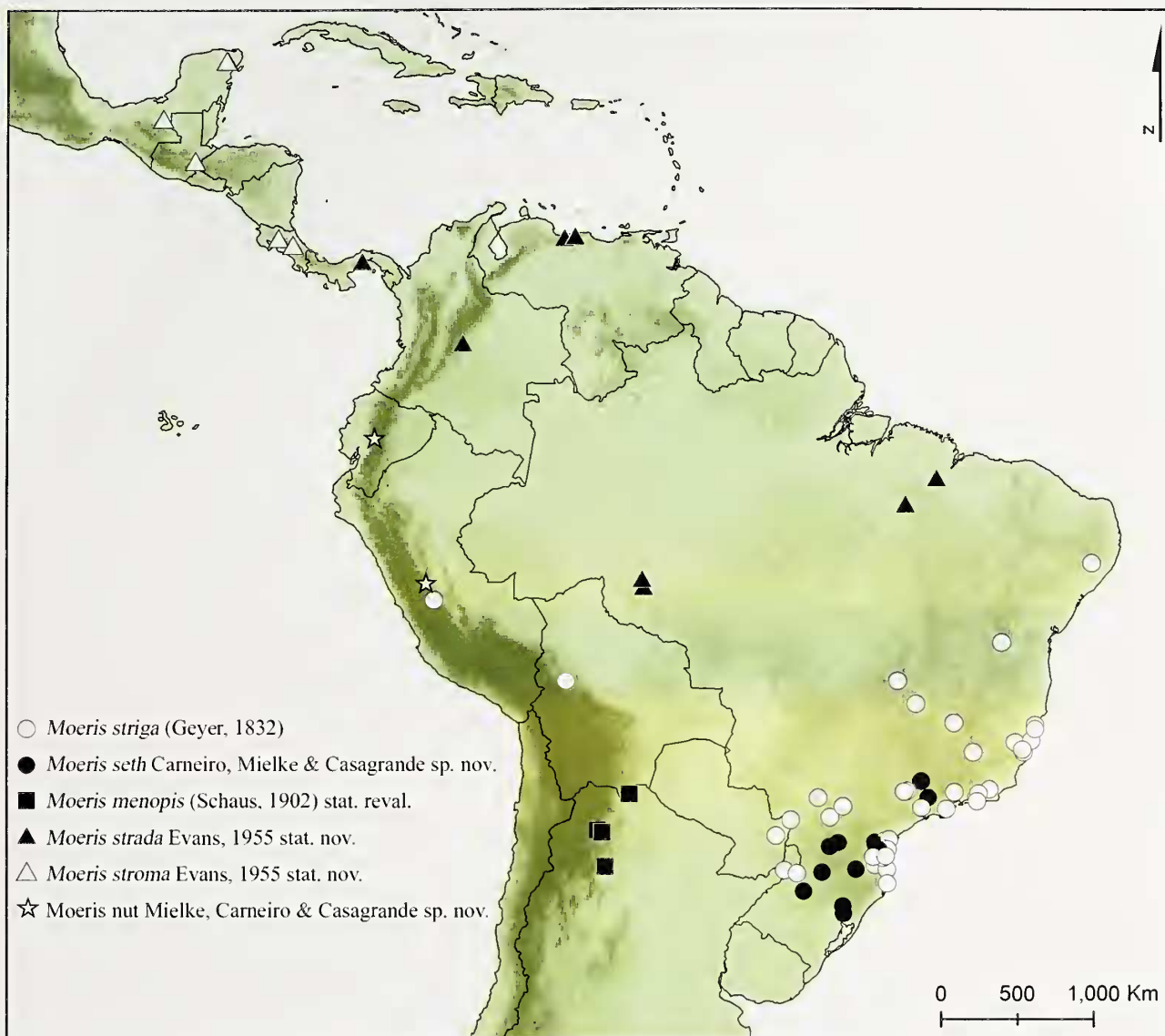


Figure 28. Geographical distribution of *Moeris* Godman, 1900 species, as observed in the present study.

Sul, Ivoti, 7.IV.2000, Moser leg., DZ 31.565 (DZUP). 1m, Rio Grande do Sul, Panambi, V.1967, Schaal leg., DZ 31.615 (DZUP). 1m, Santa Catarina, Santa Cecilia, Campo Alto, 13.II.1976, Mielke & Buzzi leg., DZ 31.435 (DZUP). 1m, Santa Catarina, Santa Cecilia, Campo Alto, 12.II.1973, Mielke & Sakakibara leg., DZ 31.517 (DZUP). 5m, 5f, Santa Catarina, Seara, Nova Teutônia, II.1969, I.1972, VIII.1977, I.1982, II.1982, III.1982, IV.1985, I.1986, Plaumann leg., DZ 31.490, DZ 31.358, DZ 31.607, DZ 31.218, DZ 31.457, DZ 31.327, DZ 31.448, DZ 31.694, DZ 31.584, DZ 31.547 (DZUP).

Remarks: This species has been misidentified as *M. striga* probably due to the lack of external distinguishing characters between these two species. Their geographical distributions are also similar, though they differ with regard to altitudinal range. *M. seth* has thus far been recorded only from high altitude regions of southeastern and southern Brazil, extending southwards into Uruguay, whereas *M. striga* is a lowland species. Characters in male and female genitalia do not vary in *M. seth* and *M. striga*, facilitating the distinction between the two species.

Etymology: The epitheton *seth* comes from the Egyptian mythological god Seth, known as the god of chaos, disorder, and storms.

Moeris menopis (Schaus, 1902) **stat. rest.**
(Figs. 3, 10, 17, 24, 28)

Diagnosis: Well-marked subapical spots R_4 - M_1 and yellowish large spots in M_3 - CuA_2 ; harpe with truncated posterior projection and spined dorsal margin; lamella antevaginalis placed anteriorly of lamella postvaginalis; ductus bursae with a conical sclerotized tube posteriorly, close to the antrium.

Remarks: This taxa was previously ranked as a subspecies of *M. striga*. However, *M. menopis* also presents unique male and female genitalia patterns, which justifies its species status.

Geographical distribution: Northwestern Argentina.

Studied material: Argentina: If, Salta, Quebrada de Ramos,

24.IV.1978, Eisele leg., OM 25.611 (OM). 1f, Salta, Abra Grande, Crán, 10.I-1.III.1967, Golbach leg., OM 25.623 (OM). 1m, Salta, Tartagal, 9.II.1950, Golbach leg., OM 25.641 (OM). 1m, Tucuman, OM 25.605, (OM). 1m, Tucuman, Las Huigeras, 24.I.1970, Mielke leg., DZ 27.488 (DZUP). 1m, 2f, Tucuman, San Miguel de Tucuman, S.P. Colalao, I.1949, Arnan leg., OM 25.635, OM 25.629, OM 25.617 (OM).

Moeris strada Evans, 1955, **stat. nov.**
(Figs. 4, 11, 18, 25, 28)

Diagnosis: Dorsal and ventral wings as in *Moeris striga*, *M. seth* and *M. stroma*. Posterior margin of harpe C-shaped, with the ventral prolongation large as in *M. stroma*, but shorter and slightly more curved dorsally. Aedeagus with a long globular cornuti with a spine on tip as in *Moeris striga*, but all others are distinctly shorter; ductus bursae greatly developed posteriorly as a conical sclerotized tube.

Remarks: This taxa was previously ranked as a subspecies of *M. striga*. Though similar in wing pattern to *Moeris striga*, *M. seth*, and *M. stroma*, *M. strada* presents unique male and female genitalia patterns which justify its species status.

Geographical distribution: Widespread among Amazonian forest to Eastern Panama.

Studied material: Colombia: 1m, Meta, Villavicencio, 21.IX.1980, Callaghan leg., OM 25.647 (OM). Panama: 1m, Panama, Balboa, 27.I.1979, Robbins leg., DZ 31.630 (DZUP). Venezuela: 1f, Aragua, Rancho Grande, 20.VIII.1955, Yepes leg., OM 25.653 (OM). 1m, Distrito Federal, Antimano, 15.VIII.1934, Lichy leg., OM 41.721 (OM).

Moeris stroma Evans, 1955 **stat. nov.**
(Figs. 5, 12, 19, 26, 28)

Diagnosis: Dorsal and ventral wings as in *Moeris striga*, *M. seth* sp. nov. and *M. strada* **stat. nov.** Posterior margin of harpe C-shaped, with the ventral prolongation large as in *M. strada* **stat. nov.**, but longer and slightly more straight posteriorly. Aedeagus with equally sized cornuti, besides the elongated ventral spine, a character present in all species of *Moeris* described above; lamella antevaginalis and sclerotized posterior part of ductus bursae both trapezoidal.

Remarks: Though similar in wing pattern to *Moeris striga*, *M. seth* sp. nov., and *M. strada*, *M. stroma* presents unique male and female genitalia patterns which justify its species status.

Geographical distribution: Central America from southern Mexico to Costa Rica.

Studied material: Costa Rica: 2m, Alajuela, Bajo Rodrigues, 17.II.1990, 14.X.1990, Pagels leg., OM 24.820 (OM). 3m, Cartago, Turrialba, 1-15.X.1971, 1-15.IV.1972, 15-30.IV.1973, Becker leg., DZ 31.361, DZ 31.684, DZ 31.784 (DZUP). Guatemala: 1m, Zacapa, La Union, 3.VII.1978, Welling leg., OM 44.690 (OM). Mexico: 2m, 1f, Quintana Roo, Nuevo Xcan, 20.VI.1972, IX.1973, 2.VII.1974, Welling leg., DZ 31.654, DZ 31.634, DZ 31.214 (DZUP). 1m, Quintana Roo, Xcan, 23.VII.1967, Welling leg., DZ 31.684 (DZUP). 2f, Tabasco, Tenosique, 13.IX.1962, 19.IX.1962, Welling leg., OM 44.304, OM 44.368 (OM).

Moeris nut Mielke, Carneiro & Casagrande sp. nov.
(Figs. 6, 13, 20, 28)

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Diagnosis: Brand bipartite and not tripartite or absent as other *Moeris* species. Posterior half of VHW with distinct iridescent bluish scales over reddish and yellowish pattern. *M. padus* Evans, 1955

and *M. hyagnis* (both subspecies) present bluish spots on VHW, but more compact, as longitudinal bands instead of transversal as in *Moeris nut* sp. nov. Harpe with a short ventral projection and inner spined protruding line parallel to posterior margin. Ampulla with a lobular dorsal projection.

Description: Forewing length: 11.5–12mm. Eyes red. Vertex dark brown. Antennae longer than 1/2 costa; club short (1/4 shaft); shaft basal portion ventrally yellowish to ochreous; nudum 12, on apiculus extended to the clava. Palpus quadrate (inner edge equal to the transverse width); second segment ventrally yellowish; third segment dark brown with sparse yellowish scales, around half of the second segment length, cylindrical. Thorax dorsally and ventrally dark brown, with distinct ochreous tegula. DFW uniformly brown, except for the sparse reddish scales on costal area, yellowish subapical spots in R_2-M_1 and black brand; brand bipartite, the first section wide, trapezoidal, in CuA_1-CuA_2 , and the second reduced and rounded, in CuA_2-2A besides CuA_2 . VFW costal area with distinct, compact scales, placed in all costal area, reddish at the base turning slightly yellowish at apex; apical spot markedly orange, contiguous with marginal band, which extends and fade beyond CuA_1 ; subapical spots in R_2-M_1 also orange, opaque, and separated by marginal band by a reddish brown radial band. DHW homogeneous brown. VHW ground color with variegated brownish, reddish and black tones; costal area and posterior half overlaid with bluish scales, except the anal fold, which is uniformly brown. Legs yellowish to ochreous; midtibia spined with pair of spurs; hind tibia spined with two pairs of spurs. Male genitalia: Median apophyses of tegumen absent. Fenestra reduced to a slender space between tegumen and uncus. Saccus not reduced nor elongated, lobed. Uncus symmetric, bifid; arms projected, medially separated from each other by a short distance, without spines on the tips. Gnathos hook-shaped with lateral membranous patch. Valva without posterior median cleft dividing ampulla from harpe; sacculus triangular; harpe projected as a short straight spine posteriorly and as a wide lobular projection dorsally, inner margin with a submarginal spine protruding. Aedeagus as long as valva + saccus length, tubular, straight; coecum globular, shorter than the distal part of aedeagus, dorsally and laterally straight; dorso-posterior and ventro-posterior end of aedeagus hollowed, hollow dorsally V-shaped, ventrally larger and U-shaped; cornuti present as four irregular relatively large spines. Fultura inferior directed dorsally and posteriorly, projections extend only laterally of aedeagus; lateral arms thin; ventrally straight, with reduced antero-ventral lobes. Female unknown.

Geographical distribution: Known from only two locations at the western Peruvian and Eastern Ecuadorian Andes.

Studied material: HOLOTYPE (OM): male with the following labels: / Holotypus / Pallatanga, Chimborazo, Ecuador, 3200m[,] VIII-1979[,] Lafebre leg. / OM 25.659 / gen. prep. E. Carneiro 2014 /. PARATYPE (OM): 1 male with the following labels: / Paratypus / Pachitea [Peru, Huánuco] / OM 12.045/.

Remarks: Known only from two specimens, but the striking differences in brand format and male genitalia confirm it as a distinct species.

Etymology: The name *nut* comes from the Egyptian mythological goddess Nut, known as the goddess of the sky.

Mnasitheus submetallescens (Hayward, 1940) **comb. nov.**
(Figs. 7, 14, 21, 27, 28)

Remarks: Previously combined to *Moeris*, this species easily recognized by the striking metallic bluish pattern present on the whole VHW. Examination of brand, male and female genitalia precludes its inclusion within *Moeris*, by comparison with its type species, *Moeris striga* (Geyer, 1832). The brand of *Mnasitheus submetallescens* **comb. nov.** is sagittated over the origin of CuA_2

and parallel elongated below CuA_2 and parallel above $2A$. The stigma of all *Moeris* species, when present, is always elongated and perpendicular to CuA_2 , whose portion below CuA_2 is rounded instead of elongated. Valva of *Mnasitheus submetallescens* presents a cleft dividing the ampulla and harpe, which is absent in all *Moeris* species, except for *M. padus*. Additionally, the dorsal bifid pointed projection of inner margin of harpe and the thin coecum of aedeagus are common features of *Mnasitheus* Godman, 1900 species, and are thought to be always absent in *Moeris*. Finally, the female genitalia of *M. submetallescens* present a pair of elongated sclerotized projections besides ductus bursae. This unique character has not been observed elsewhere in Moncini besides *Mnasitheus* species, including *Mnasitheus chrysophrys* (Mabille, 1891), the type species of the genus.

Geographical distribution: Widespread among Atlantic forest.

Studied material: **Argentina:** 1m, Misiones, Almirante Brown, Reserva Yacutinga, 2-5.III.2007, Mielke & Casagrande leg., DZ 31.215 (DZUP). **Bolivia:** 1f, La Paz, Caranavi, I-II.1990, Tello leg., OM 26.499 (OM). **Brazil:** 1m, Paraná, Foz do Iguaçu, Parque Nacional do Iguaçu, 21-24.IV.1995, Mielke & Casagrande leg., DZ 31.734 (DZUP). 1f, Paraná, Foz do Iguaçu Parque Nacional do Iguaçu, 20-26.VIII.2000, Mielke leg., OM 51.287 (OM). 1m, Rio Grande do Sul, Santa Rosa, 26.XII.1953, Biezanko leg., OM 29.930 (OM). 3f, Santa Catarina, Seara, Nova Teutônia, I.1965, XII.1972, I.1986, Plaumann leg., OM 29.912, OM 29.918, OM 29.960 (OM). **Paraguay:** 1m, Alto Parana, Itakyry, General Dias, 15-20.I.1980, O. Mielke, C. Mielke & Miers leg., DZ 31.644 (DZUP). **Peru:** 1f, Cuzco, Marcapata, OM 12.079 (OM). 2m, Madre de Dios, Pakitza, Parque Manu, 29.IX.1991, 13.X.1991, Mielke leg., DZ 9.742, DZ 27.518 (DZUP). 1m, Madre de Dios, Puerto Maldonado, IX-XI.1992, Tello leg., OM 34.259 (OM). 1m, Madre de Dios, Tambopata, Tambopata Reserve, 26.X.1991, Mielke leg., DZ 31.595 (DZUP).

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